CLAIMS

What is claimed is:

1. A beamforming probe including an array of transducer elements, the probe comprising:

a first processing board comprising a first signal processor;

receive signal connections, for a receive aperture comprising a plurality of transducer elements, coupled to the first signal processor, the receive signal connections coupling receive signals arising from the transducer elements to the first signal processor; and

a cache memory coupled to the first signal processor, the cache memory comprising directional parameters for the receive aperture;

where the first signal processor retrieves directional parameters, determines a beamforming delay derived from the directional parameter for each transducer element in the receive aperture, and applies the respective beamforming delay to each receive signal.

2. The beamforming probe of claim 1, where one of the directional parameters is a inclination value .

3. The beamforming probe of claim 1, wherein the beamforming delay is implemented as a phase shift.

4. The beamforming probe of claim 1, wherein the cache memory comprises at least one of dynamic and static setup information.

5. The beamforming probe of claim 1, wherein the cache memory comprises dynamic setup information containing delay setup.

6. The beamforming probe of claim 1, wherein the cache memory comprises static setup information containing spatial element location.

7. The beamforming probe of claim 1, where the receive aperture is a triangular aperture.

8. The beamforming probe of claim 1, where:

the receive signal connections couple receive signals for a plurality of receive apertures to the first signal processor;

the cache memory stores directional parameters for each of the receive apertures; and

the first signal processor retrieves the directional parameters for each receive aperture, determines a beamforming delay derived from the directional parameters for each transducer element in each receive aperture, and applies the beamforming delay to the receive signal obtained from the respective transducer element.

9. The beamforming probe of claim 1, further comprising a cache memory controller coupled to the cache memory, the cache memory controller storing the directional parameters in the cache memory.

10. The beamforming probe of claim 9, further comprising a communication interface coupled to the cache memory controller for interfacing with a system host.

11. The beamforming probe of claim 10, where the cache memory controller obtains the directional parameters using the communication interface.

12. The beamforming probe of claim 1, further comprising:

a second processing board comprising a second signal processor;

second receive signal connections, for a second receive aperture comprising a plurality of second transducer elements, coupled to the second signal processor, for coupling second receive signals arising from the second transducer elements to the second signal processor; and

the cache memory coupled to the second signal processor, the cache memory comprising second directional parameters for the second receive aperture;

where the second signal processor retrieves the second directional parameters, determines a beamforming delay derived from the second directional parameters for each transducer element in the second receive aperture, and applies the respective beamforming delay to each second receive signal.

13. The beamforming probe of claim 1, further comprising a cache memory controller coupled to the cache memory, the cache memory controller storing the directional parameters in the cache memory.

14. A beamforming probe comprising:

a first processing board comprising a first signal processor;

a second processing broad comprising a second signal processor; and

receive signal connections for a plurality of receive apertures, each comprising a plurality of transducer elements, the receive signal connections distributed between the first and second signal processors;

where the receive signal connections couple each receive aperture to at least one of the signal processors without partitioning any receive aperture between the processing boards; and

a first cache memory coupled to the first signal processor, the first cache memory comprising a directional parameter for a selected receive aperture distributed to the first signal processor.

15. The beamforming probe of claim 14, where the first signal processor:

retrieves the directional parameter for the selected receive aperture; and

determines, for a selected transducer element of the selected receive aperture, a beamforming delay derived from the directional parameter .

16. The beamforming probe of claim 14, where the first signal processor applies the beamforming delay to a receive signal arising from the selected transducer element.

17. The beamforming probe of claim 14, wherein the cache memory is coupled to the second signal processor, the cache memory comprising a directional parameter for a selected receive aperture distributed to the second signal processor.

18. The beamforming probe of claim 14, where the receive signal connections distribute at least one triangular receive aperture to the first and second signal processors.

19. The beamforming probe of claim 14, further comprising a receive aperture output driven by the first signal processor.

20. The beamforming probe of claim 14, where the receive aperture output carries a beamformed reception signal for the selected receive aperture.

21. The beamforming probe of claim 14, further comprising a location memory coupled to the first signal processor, the location memory comprising a spatial location for a selected receive aperture.

22. A method for beamforming in an ultrasound probe, the method comprising :

coupling, to a first signal processor, receive signals arising from a receive aperture;

retrieving, from a cache memory, a directional parameter for the receive aperture; and

determining a beamforming delay derived from the directional parameter for a selected transducer element comprising the receive aperture.

23. The method of claim 22, further comprising applying the beamforming delay to a receive signal arising from the selected transducer element.

24. The method of claim 22, further comprising applying a plurality of beamforming delays to a plurality of receive signals arising from the receive aperture.

25. The method of claim 22, where coupling comprises coupling receive signals arising from a plurality of receive apertures to the first signal processor on a first processor board and to a second signal processor on a second processor board;

where no receive aperture is partitioned between the first and second processing boards.

26. The method of claim 22, further comprising storing a spatial location in a location memory.

27. The method of claim 22, further comprising receiving the directional parameter from a host system.

28. The method of claim 22, further comprising the step of receiving the directional parameter from a host system at a cache memory controller.

29. The method of claim 22, further comprising maintaining a link between the cache memory and a host system according to a standard defined by IEEE 1596.

30. The method of claim 22, further comprising storing the directional parameter in the cache memory.

31. The method of claim 22, further comprising :

receiving a plurality of directional parameters for receive apertures coupled to the first and second processors from a host system at a cache memory controller; and

transferring the directional parameters for receive apertures coupled to the first processor to the first processor board and transferring the directional parameters for receive apertures coupled to the second processor to the second processor board.

32. The method of claim 22, further comprising inputting to the first signal processor a test signal configured to do at least one of calibrate and verify operation of the first signal processor.

33. The method of claim 22, further comprising storing, in memory on the probe, a key containing information validating probe commands.